

**OCCUPATIONAL SAFETY
AND HEALTH STANDARDS BOARD**

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**PROPOSED PETITION DECISION OF THE
OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD
(PETITION FILE NO. 524)****INTRODUCTION**

The Occupational Safety and Health Standards Board (Board) received a petition on July 5, 2011, from Bill Taylor, CSP, representing the Public Agency Safety Management Association South Chapter, (Petitioner). The Petitioner requests the Board to amend Title 8, California Code of Regulations, Section 5199, Aerosol Transmissible Diseases, Subsection (g)(3)(B), Exception 2. The petition concerns respirator protection for employees throughout the state who provide emergency medical services to persons who are cases or suspected cases of airborne infectious diseases.

Labor Code section 142.2 permits interested persons to propose new or revised regulations concerning occupational safety and health and requires the Board to consider such proposals, and render a decision no later than six months following receipt. Further, as required by Labor Code section 147, any proposed occupational safety or health standard received by the Board from a source other than the Division of Occupational Safety and Health (Division) must be referred to the Division for evaluation, and the Division has 60 days after receipt to submit a report on the proposal.

SUMMARY

The Petitioner is requesting amendments that would permit paramedics and other emergency medical personnel to use N100 respirators in non-oil environments in lieu of the P100 respirators allowed in Section 5199(g)(3)(B), Exception 2. It should be noted that N100 respirators are not designed for use in oil aerosol environments while P100 respirators maintain their particle filtering capabilities in such environments.

DIVISION'S EVALUATION

The Division's evaluation report dated October 10, 2011, states that the issue of respiratory protection for high hazard procedures was discussed during the five year advisory process that led to the adoption of Section 5199. However, there was little discussion of N100 respirators, because at the time there were few such models on the market. In the past two years, partly as a result of the 2009 H1N1 epidemic, the respirator market has changed. There have also been additional studies regarding the efficacy of respiratory protection in regards to infectious aerosols.

The Division stated a concern as to whether N-series filters may be less effective in filtering viruses and virus-size particles than P100 respirators. Studies have found that N95 respirators are less effective than P100 respirators for these particles. There are no published studies comparing the effectiveness of N100 and P100 respirators. There are also no published studies regarding whether the materials and construction of N95, N100, and P100 filtering facepiece respirators may affect the ability of the respirator to maintain its seal with the face under different conditions of use.

There are also significant issues regarding how emergency medical services employers will be able to assess each environment to ensure that appropriate respiratory protection is available to employees who perform high hazard procedures on persons who are suspected or confirmed as having an airborne infectious disease.

The Division recommends that the Board grant the petition to the extent that an advisory committee be convened by the Division so that these issues and any proposed regulatory changes can be fully discussed.

STAFF'S EVALUATION

Section 5199(g)(3)(B) requires, in part, that employees performing high hazard procedures use a powered air purifying respirator (PAPR) or a respirator providing equivalent or superior protection, unless the employer determines that this use would interfere with the successful performance of the required task or tasks. Exception No. 2 to Section 5199(g)(3)(B) allows paramedics and other emergency medical personnel in field operations to use a P100 respirator in lieu of a PAPR. High hazard procedures are defined as procedures performed on a person who is a case or suspected case of an aerosol transmissible disease, in which the potential for being exposed to aerosol transmissible pathogens is increased due to the reasonably anticipated generation of aerosolized pathogens. Such procedures include, but are not limited to, sputum induction, bronchoscopy, aerosolized administration of pentamidine or other medications, and pulmonary function testing.

Respirator filters must meet stringent certification tests established by National Institute of Occupational Safety and Health (NIOSH) in 42 CFR Part 84. Respirator filters that collect at least 95% of the "challenge aerosol" are given a "95" rating. Those that collect at least 99% receive a "99" rating. And those that collect at least 99.97% (essentially 100%) receive a "100" rating. Respirator filters are rated as "N," "R," or "P" for their level of protection against oil aerosols. This rating is important in industry because some industrial oils can remove electrostatic charges from the filter media, thereby degrading (reducing) the filter efficiency performance. Respirators are rated "N" if they are not resistant to oil, "R" if somewhat resistant to oil, and "P" if strongly resistant (oil proof).

All filter tests employ the most penetrating aerosol size, 0.3 μm aerodynamic mass median diameter. The N-series are tested against a mildly degrading aerosol of sodium chloride. The R- and P-series filters are tested against a highly degrading aerosol of dioctylphthalate. NIOSH

states that the N-series filters should be restricted to use in those workplaces free of oil or other severely degrading aerosols. There is no similar restriction for P-series filters.

It should be noted that a permanent variance has been granted by the Board to the California Department of Forestry and Fire Protection (Cal Fire) in OSHSB Variance File No. 10-V-040 to permit the use of N100 respirators in environments that do not contain oil aerosols. The Cal Fire variance conditions require the use of P100 respirators in atmospheres that may contain oil aerosols or where such atmospheres are anticipated to be encountered. Several other fire jurisdictions have applied for similar permanent variances.

NIOSH was queried as to the particulate filtering effectiveness of N100 respirators versus P100 respirators in atmospheres that are not contaminated with oil aerosols. On September 15, 2010, Mr. Roland Berry Ann, Deputy Director of the NIOSH National Personal Protective Technology Laboratory, posted the following information on the NIOSH Science Blog website.¹

“I am unaware of any published studies that compared the filtering efficiencies of N100 filter respirators to P100 filter respirators. The different test methods and certification criteria for N100 and P100 respirators do not provide a basis for concluding that either an N100 or a P100 filter respirator is more efficient than the other in filtering microbial and viral particulates from air that is not contaminated with oil. The particle size distributions of the sodium chloride test aerosol for the N-series filters (with a count median diameter of 0.075 ± 0.020 micrometer and a standard geometric deviation not exceeding 1.86) and the Dioctyl Phthalate (DOP) test aerosol for the R- and P-series filters (with a count median diameter of 0.185 ± 0.020 micrometer and a standard geometric deviation not exceeding 1.60) may appear to present different test conditions. However, the size distributions were specified to provide both test aerosols the same aerodynamic diameter. Therefore, there is no measurable difference in the relative effectiveness of the filtering efficiencies of P100 vs. N100 respirators for protection against any particulates, including airborne-transmitted infectious disease. You should be aware that the differences in face seal leakage around the perimeter of tight-fitting respirators with varying various models' fitting characteristics on a worker has greater impact on the respirator's relative effectiveness compared to another filtering respirator than the type of NIOSH-approved filter.”

Based on the information provided by NIOSH, staff concludes that N100 respirators provide protection against aerosol infectious diseases that is equivalent to the protection provided by P100 respirators, provided that the atmosphere is not contaminated with oil aerosols.

The provisions of Section 5199(g)(3)(B) apply to all fire jurisdictions – state, local, city, municipal, county and volunteer fire departments. It also pertains to employers with private fire brigades and any other agencies or employers with emergency medical personnel such as ambulance companies, and health care providers that employ responders such as emergency

¹ NIOSH Science Blog, N95 Respirators and Surgical Masks,
http://www.cdc.gov/niosh/blog/nsb101409_respirator.html

medical technicians. Board staff believes that input from various stakeholders in the format of an advisory committee would be beneficial. Given the broad scope of employers affected by the provisions of Section 5199(g)(3)(B), the committee should determine whether additional safety precautions associated with the Petitioner's recommendations should be considered and determine the necessity for any rulemaking action.

Particulate filtering laboratory tests have shown that the filtering capabilities of the N95 respirator are not as effective as the N100 or P100 respirators. However, other stakeholders may have specific recommendations regarding the use of N100 respirators.

Board staff believes there is merit to considering amendments to Section 5199(g)(3)(B) that would permit the use of N100 respirators under specific conditions when a risk assessment has been conducted by qualified safety and health experts. For the reasons stated above, including the broad scope of employers subject to the provisions of Section 5199(g)(3)(B), Board staff believes that an advisory committee of stakeholders should be convened by the Division to consider the Petitioner's recommendations (the Division should convene the advisory committee, because the Division is the lead agency for health issues of this sort).

CONCLUSION AND ORDER

The Board has considered the petition and the recommendations of the Division and Board staff. For reasons stated in the preceding discussion, the petition is hereby GRANTED to the extent that the Division is requested to convene a representative advisory committee to consider the Petitioner's recommendations. The Petitioner should be invited to participate in the committee deliberations.